

Claims

[c1] What is claimed is:

1. A method for recording a plurality of data sets onto an optical storage medium by utilizing a temporary storage device in an optical storage system, the optical storage system comprising a memory for storing the plurality of data sets, the optical storage medium comprising a plurality of data blocks and a plurality of spare data blocks being installed on the optical storage medium, each data block being utilized for recording a data set, each spare data block being utilized for substituting for a defective data block to record the data set corresponding to the defective data block, the method comprising:
storing a plurality of data sets corresponding to a plurality of defective data blocks in the memory into the temporary storage device;
re-arranging a sequence of the plurality of data sets corresponding to the plurality of defective data blocks in the temporary storage device according to a sorting process; and
recording the plurality of re-arranged data sets in the temporary storage device into the plurality of spare data blocks of the optical storage medium.

- [c2] 2. The method of claim 1 wherein each data set corresponding to a defective data block corresponds to a spare data block number, and each spare data block number corresponds to a spare data block of the optical storage medium; the method further comprising:
utilizing the sorting process to arrange the plurality of data sets in the temporary storage device according to a sequence of the plurality of spare data block numbers.
- [c3] 3. The method of claim 2 wherein each relationship between a data set corresponding to a defective data block and a spare data block number is recorded in a defect record table of the optical storage medium.
- [c4] 4. The method of claim 2 wherein the memory comprises a main storing section and a spare storing section, the main storing section utilized for storing a plurality of data sets transmitted from a main controller, the spare storing section utilized for storing a plurality of data sets corresponding to a plurality of defective data blocks; the method further comprising:
sequentially recording a plurality of data sets corresponding to consecutive spare data block numbers in the temporary storage device into the spare storing section;
and
sequentially recording a plurality of data sets corre-

sponding to consecutive spare data block numbers in the spare storing section into a plurality of adjacent spare data blocks of the optical storage medium during a seeking process.

- [c5] 5. The method of claim 4 wherein the main storing section and the spare storing section of the memory are respectively a ring buffer.
- [c6] 6. The method of claim 4 further comprising:
recording a predetermined number of data sets corresponding to consecutive spare data block numbers in the temporary storage device into the spare storing section at a time; and
recording a predetermined number of data sets corresponding to consecutive spare data block numbers in the spare storing section into a plurality of adjacent spare data blocks of the optical storage medium at a time;
wherein the predetermined number is determined according to a memory capacity of the spare storing section.
- [c7] 7. The method of claim 1 wherein the optical storage medium is an optical disc conforming to a CD-MRW (Compact Disk-Mount Rainier ReWritable) standard, an optical disk conforming to a DVD (Digital Versatile Disk)+MRW standard, or other re-writable optical stor-

age media.

- [c8] 8. A method for recording a plurality of data sets onto an optical storage medium in an optical storage system to reduce seeking processes, the optical storage medium being installed with a plurality of data blocks and a plurality of spare data blocks, each data block utilized for recording a data set, each spare data block utilized for substituting for a defective data block to record a data set corresponding to the defective data block, the optical storage system comprising:
- a memory comprising a main storing section and a spare storing section; and
 - a temporary storage device electrically connected to the memory for temporarily storing data sets;
- the method comprising:
- utilizing the main storing section to store the plurality of data sets;
 - storing a predetermined number of data sets corresponding to a predetermined number of defective data blocks in the main storing section into the temporary storage device, wherein the predetermined number is determined according to a memory capacity of the main storing section;
 - re-arranging a sequence of the predetermined number of data sets in the temporary storage device according to

a sorting process;
recording the predetermined number of re-arranged data sets in the temporary storage device into the spare storing section; and
recording the predetermined number of re-arranged data sets in the spare storing section into a predetermined number of corresponding spare data blocks of the optical storage medium.

[c9] 9. The method of claim 8 wherein each data set corresponding to a defective data block corresponds to a spare data block number, and each spare data block number corresponds to a spare data block of the optical storage medium; the method further comprising:
utilizing the sorting process to arrange the predetermined number of data sets in the temporary storage device according to a sequence of the predetermined number of spare data block numbers.

[c10] 10. The method of claim 9 further comprising:
sequentially recording the predetermined number of data sets in the temporary storage device into the spare storing section; and
sequentially recording a plurality of data sets corresponding to consecutive spare data block numbers among the predetermined number of data sets into a plurality of adjacent spare data blocks of the optical

storage medium during a seeking process.

- [c11] 11. The method of claim 9 wherein each relationship between a data set corresponding to a defective data block and a spare data block number is recorded in a defect record table of the optical storage medium.
- [c12] 12. The method of claim 8 wherein the main storing section and the spare storing section of the memory are respectively a ring buffer.
- [c13] 13. The method of claim 8 wherein the optical storage medium is an optical disc conforming to a CD-MRW (Compact Disk-Mount Rainier ReWritable) standard, an optical disk conforming to a DVD (Digital Versatile Disk)+MRW standard, or other re-writable optical storage media.
- [c14] 14. A method for recording a plurality of data sets into a plurality of adjacent spare data blocks of an optical storage medium during a seeking process, each data set corresponding to a spare data block number, each spare data block number corresponding to a spare data block, the method comprising:
 - (a) arranging the plurality of data sets according to a sequence of the plurality of corresponding spare data block numbers so that the plurality of spare data block

numbers of the plurality of arranged data sets become consecutive spare data block numbers; and
(b) after proceeding with step(a), recording the plurality of arranged data sets into a plurality of adjacent spare data blocks during a seeking process.

- [c15] 15. The method of claim 14 wherein the optical storage medium further comprises a plurality of data blocks, and each spare data block is utilized for substituting for a defective data block to record a data set corresponding to the defective data block.
- [c16] 16. The method of claim 14 being applied to an optical storage system, wherein the optical storage medium is an optical disc conforming to a CD-MRW (Compact Disk-Mount Rainier ReWritable) standard, an optical disk conforming to a DVD (Digital Versatile Disk)+MRW standard, or other re-writable optical storage media.